REMARKS

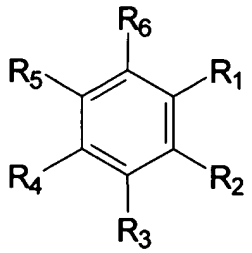
Claims 1-39 are currently pending. Claims 12 and 16 are amended herein to clarify the claimed subject matter. Claims 35, 36, 38, and 39 are canceled herein without prejudice. Accordingly, instant claims 1-34 and 37 are presently under consideration.

Support for amendment to the claims is found in the specification as originally filed and the original claims. Claims 12 and 16 are amended herein to rectify clerical errors. Support for amendment to claims 12 and 16 is found, for example, in original claims 12 and 16. No issue of new matter is hereby introduced.

Rejections under 35 USC § 103

Claims 1-39 are rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Pon et al. [United States Patent Number (USPN) 6,043,353]. United States Publication Serial Number (US) 2002/0076723 is further cited to show the state of the art. Claims 35, 36, 38, and 39 are canceled herein, thereby obviating any rejection of these claims. In view of Applicant's arguments presented herein, the rejection, as it applied to claims 1-39, is respectfully traversed.

The claims are directed to a method for modifying an amino-terminated surface of a solid support with carboxy groups comprising *inter alia* the steps of: a) providing an amino-terminated surface; and b) contacting the surface with a compound of the general formula (I):



(I).

Accordingly, the present method claims call for contacting the surface with a compound which is an aromatic acid having the general formula (I). In contrast, Pon et al. in particular and US 2002/0076723, which reflects the general state of the art, teach contacting the surface with "bifunctional linkers", which are flexible aliphatic chains

having acid groups at either end that can each react with the surface. It is, moreover, noteworthy that Pon et al. and the prior art as reflected in the teaching of US 2002/0076723 are silent with regard to the "tri-functional linkers" of the present invention having the general formula (I). The limitations of the flexible aliphatic chains of the prior art are described in the instant specification in several passages, as are the advantages of the aromatic acid linkers of the present invention. See, for example, paragraphs [0031]-[0032] and [0085]-[0086] of United States Publication Serial Number 2007/0042109, which corresponds to the present application. The Examiner's attention is respectfully directed to paragraphs [0031]-[0032] of the US 2007/0042109, which state the following:

> *[0031] Reactivity of amines with activated carboxylic acid is well known in prior art and is exploited in organic synthesis, chemical modification of proteins as well as in the chemical modification of solid surfaces. One of common strategies in the case of glass modification is to treat aminosilanated glass surface with a so-called "bifunctional linker" possessing on one end of the molecule the activated group capable of reacting with the surface amino groups, while the other extremity is available for the reaction(s) with solution species of interest. Covalent coupling of biomolecules to the glass surface modified with bifunctional linker normally proceeds in a two separate stages. In the first step, silanized glass is reacted with the reagent forming a monolayer (or sub-monolayer) which introduces to the glass a certain reactivity towards solution species (i.e., DNA, or protein). In the second step, immobilization of the solution species to the activated glass surface can be achieved either spontaneously and/or thermally, photochemically, or by other methods known in the art. The main disadvantages of activated "bifunctional linkers" are: relatively low chemically stability of coupling reagents towards hydrolysis, relatively high cost, slow reaction kinetics and relatively high bulk concentrations of solution species required in order to drive the immobilization reaction on solid surface to its completion. Another disadvantage of "bifunctional linkers" is that aliphatic acids having -COOH group at both extremities of the aliphatic chain are relatively flexible so that both*

of the activated carboxylic groups may react with the amine-terminated surface. This is likely to introduce a certain degree of hydrophobicity to the solid surface and could lead to decrease in the amount of free carboxyl groups available for the covalent attachment of biomolecules to the solid surface.

[0032] The present invention is based on bulk catalyst-mediated covalent attachment of "tri-functional linkers" based on tricarboxylic acid to the aminosiloxane-modified glass surface (FIG. 1) followed by carbodiimide-catalyzed immobilization of amine-containing DNA to the glass surface (FIG. 2). Preferred aromatic trifunctional compounds used herein are benzene-1,3,5-triacetic acid (BTA) and trimesic acid (TMA). The main advantages when using these aromatic molecules over aliphatic bicarboxylic acids is that even though two carboxylic groups of the aromatic linker molecule may react with the surface amino groups, one -COOH would still remain available for the immobilization biomolecules to the solid surface. One important advantage of the present invention is the fact that it relies on bulk catalysis for both, glass carboxylation as well as covalent coupling of the aminoalkyl-substituted DNA to carboxyl-terminated surface. This in turn results in a more robust chemistry as compared to classical methods relying exclusively on the use of bifunctional linkers. (emphasis added)

In order to identify compounds with improved properties relative to those of prior art "bifunctional linkers", the present inventors screened a large number of chemicals and subsequently demonstrated that optimal results are obtained using the aromatic compounds described by the general formula (I). See, for example, paragraph [0085] and the Examples, experimental results, and Figures of US 2007/0042109. As detailed in the present specification, compounds having the general formula (I) yield excellent results by providing carboxylated solid surfaces with good properties (high loading capacity, good electrostatic properties and hydrophilic character) which permit optimal immobilization and hybridization of nucleic acids. The specific geometry of these tricarboxylic acids is

cited as responsible for conferring these improved properties. See, for example, paragraph [0086] of US 2007/0042109.

In light of the above, it is apparent that Pon et al. and US 2002/0076723, which is cited as indicative of the state of the art, fail to teach or suggest a recited element of the instant claims. Moreover, neither the Pon et al. reference nor US 2002/0076723 demonstrates any appreciation of the surprising and advantageous properties of the "tri-functional linkers" of the present invention having the general formula (I). That being the case, Pon et al. when considered alone or in combination with US 2002/0076723 fails to render obvious the present claims.

In view of the above, Applicant deferentially requests that the rejection of claims 1-39 under 35 U.S.C. § 103(a) as allegedly unpatentable over Pon et al. be reconsidered and withdrawn.

Fees

No additional fees are believed to be necessitated by this amendment. However, should this be an error, authorization is hereby given to charge Deposit Account No. 11-1153 for any underpayment or to credit any overpayment.

Conclusion

It is submitted, therefore, that the claims are in condition for allowance. No new matter has been introduced. From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such action is earnestly solicited. In the event that there are any questions concerning this amendment, or application in general, the Examiner is respectfully urged to telephone the undersigned so that prosecution of this application may be expedited.

Respectfully submitted,

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Date: August 17, 2009

Enclosure: Petition for a One Month Extension of Time